

## **Case Study—Greenhouse Gas**

### ***“ETV HAS OPENED DOORS WE DIDN’T ANTICIPATE IT WOULD”***

Large- and medium-scale gas-fired turbines have been used to generate electricity since the 1950s, but recent developments have enabled the introduction of much smaller turbines, known as microturbines. Microturbines are one of a new breed of technologies developed to serve the growing distributed electricity generation industry, which, according to the U.S. Department of Energy, is poised to satisfy a significant fraction of U.S. growth in electricity demand. Use of microturbines can significantly reduce emissions of greenhouse gases and other air pollutants, provide new electricity generation capacity quickly with off-the-shelf technology, and provide new business opportunities for small and large companies. Microturbines, when coupled with exhaust heat recovery systems for co-generation, can produce even greater environmental benefits, and due to their high-energy conversion efficiency, can conserve valuable U.S. energy resources.

The Heat PlusPower™ system, offered by **Mariah Energy Corporation** of Calgary, Canada, is a microturbine co-generation system capable of supplying heat and electricity at small- and medium-sized commercial buildings. At the heart of the system are: (1) the U.S.-based **Capstone MicroTurbine®**, which produces electricity from a gas-fired turbine generator, and (2) the waste heat recovery unit and energy management system integrated into the Capstone unit by Mariah. The ETV Greenhouse Gas Technology Pilot verified a 30kW Heat PlusPower™ system, which was installed in the mechanical room of a new 12-unit live/work building and designed to supply all of the electricity and 80 percent of the hot water and space heating required by the building.

“We’ve worked hard to develop an efficient and affordable system,” said Paul Liddy, President and CEO of Mariah Energy, “and we knew ETV verification could show the system’s strong technical capabilities and environmental benefits.” The verification testing showed that use of the Heat PlusPower™ system significantly reduced emissions of CO<sub>2</sub> and NO<sub>x</sub>, and that energy efficiency is high—about three times higher than use of a microturbine without heat recovery. Liddy explains that, “People are skeptical of new technology, which is why Mariah Energy needed believable third-party verification. It may be years before we know the impact ETV had on sales, but it is already an important factor in discussions with our new customers, and ETV has opened doors we didn’t anticipate it would. For example, new partnering organizations are using ETV data to make decisions on investing in our technology. Also, new opportunities to conduct field demonstrations have occurred, and we’ve been invited to testify at Senate hearings on clean high performance energy technology.”